FIG. **3** depicts a voice mail system **68** performing unification;

FIG. **4** depicts a real integrated system **100**;

FIG. **5** depicts the functional architecture of a system according to the present invention;

FIG. **6** depicts a distributed architecture system **130** according to the present invention;

FIG. **7** illustrates the flow of control during a refresh operation;

FIGS. **8** and **9** depict message list and group list templates, respectively;

FIG. **10** illustrates the flow of control in a retrieval operation; and

FIG. **11** depicts a message retrieval template.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention provides an integrated multimedia mailbox and unified messaging. The term "mailbox" is used to mean an entity visible to the subscriber. This is the entity the subscriber logs into and appears to operate on when the subscriber performs mail-related operations. This subscriber-visible entity may not correspond directly with a single implementation entity, but may exist only through the cooperation of several distinct messaging systems, each with its own message storage capability. To avoid confusion, the term "mailbox" is used to mean only the subscriber visible entity, and, where necessary, the term "message endpoint" is used to denote the implementation entity or entities which underlie the integrated mailbox.

Integrated mailboxes have certain desirable and preferable characteristics. A fully integrated mailbox, in accordance with the present invention, includes the following major capabilities that are not present in a single-media mailbox:

a. The ability to deal with messages of different data/information types, or having multiple parts (multimedia mailbox).

b. A single inventory (message list), listing all messages of all data types, with the ability to control presentation of the inventory (e.g., sort the inventory according to message type, priority, or time of deposit, regardless of the type of message), with conceptually similar user interface actions for equivalent operations on any message type, and with the ability to randomly select messages for retrieval.

c. Notification mechanism(s) which can be used to alert the user of the deposit of any type of message.

d. The ability to access the mailbox through a variety of commonly-available mailbox access terminals (PC, DTMF phone, etc.), without special equipment, and with, as far as practicable, logically the same capabilities for all terminal types

e. The ability to perform data type conversions automatically, in support of transparent multi-terminal user access, or upon subscriber explicit request

f. The ability to receive and send messages to subscribers of existing messaging systems, using a variety of widely-implemented messaging protocols.

Note that there are degrees of integration in today's single-media mailboxes, both with respect of allowed message types and the access terminal types which can be used. For instance, integrated facsimile/voice mailboxes are common today, and e-mail can be used to transfer non-text information. Similarly, e-mail mailboxes cannot be accessed using telephones, and voice/facsimile mailboxes cannot be accessed using a PC.

Although it is possible to have a mailbox which is integrated with respect to multiple message types but which can only be accessed through a single type of terminal (e.g., e-mail systems using MIME), a fully integrated mailbox is preferably accessible from several types of terminals and pathways, to maximize the subscriber's ability to access his messages in various circumstances. The following terminal types are provided by the present invention: a. Conventional DTMF telephone handset; and b. Personal Computer (PC).

However, other terminal types such as personal digital assistants, cellular telephones, two way pagers, etc. can be used.

It should be emphasized that an integrated mailbox subscriber using the present invention is able to dynamically change the terminal used, from session to session.

The integrated messaging system (IMS) of the present invention is preferably interfaced to external systems. This allows the subscriber to exchange messages with external subscribers and can be used to integrate several existing messaging accounts on different systems so that the user accesses a single (virtual) integrated mailbox. The following types of external systems can be included:

a. The Internet.

b. Commercial subscription mail systems (usually X.400).

c. Private mail systems (e.g., MS Mail, cc:Mail).

d. CPE voicemail systems and other foreign network-based voicemail systems (e.g., the subscriber's cellular phone voice mailbox).

There are several ways, in accordance with the present invention, in which integrated messaging can be realized. However, the preferred approaches are discussed below.

The integration of the mailbox can be real or virtual. "Real" mailbox integration means that the messages of all types are located in a single messaging system (MS), and that subscriber and administrative control facilities for messages and mailbox configuration parameters are provided at a single user interface point and do not involve cooperation or interaction with any other MS. "Virtual" integrated mailboxes provide the same subscriber-visible functionality, and appear the same to the subscriber as a real integrated mailbox. However, in the virtual integrated mailbox, the subscriber's messages are stored in at least two different MSs, whose configuration can be (but need not be) performed separately. The different messaging systems cooperate to provide the complete functionality. The term "associated MS" is used to denote an MS that is in a special relationship with another MS for the purposes of synthesizing a virtual IMS, and the term "external MS" is used to denote an MS which is not so closely associated, but which still has an interface to the IMS.

The distinction between real and virtual integrated mailboxes is invisible to the subscriber. Real messaging systems can comprise multiple subsystems, such as the preferred distributed system described herein, with the "mailbox" spread across several pieces of hardware. Both types of integration need interfaces to external MSs, even if they are not part of a virtual IMS. The relationship between the MSs that are being integrated into a virtual IMS ("associated MSs") is much closer than that between MSs that just happen to interwork ("external MSs"). While an integrated mailbox system could be totally self-contained (allowing messaging only between its subscribers, like most voicemail systems today), it is preferable to be able to send and receive mail from other systems. Real mailbox integration is preferred and described in detail herein.